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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/916,566   | 07/27/2001  | Jyoti Mazumder       | POM-12502/29        | 1977             |
| 25006 7590 02/02/2009<br>GIFFORD, KRASS, SPRINKLE, ANDERSON & CITKOWSKI, P.C<br>PO BOX 7021<br>TROY, MI 48007-7021 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| BAHTA, KIDEST  |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

09/916,566

**Applicant(s)**

MAZUMDER ET AL.

**Examiner**

KIDEST BAHTA

**Art Unit**

2123

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No./Mail Date: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 5-8 and newly added claim 9 is pending.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeantette et al. (US 6,046,426) in view of Kar et al. (US 6,526,327 B2). Jeantette discloses:

As claims 5 and 9,

5. A method of depositing material on a substrate (Col. 1, lines 10-14), comprising the steps of: heating the substrate with a high-power, rapid-response laser to create a melt

pool in a laser interaction zone (Col. 9, lines 15-24; Col. 8, lines 48-51 ; Col. 2, lines 10-16); feeding material into the melt pool to create a deposit having a physical dimension (Col. 2, lines 10-36); monitoring the laser interaction zone to generate an optical signal indicative of the physical dimension (Col. 8, lines 28-60, i.e., a laser based triangulation device uses a diode laser that allows real-time, position-sensing data to be used to correct for variation in layer thickness, and provide a further signal for closed-loop process control); and controlling the deposition using the optical signal (Col. 8, lines 28-67, i.e. feedback control or closed-loop control is used with the laser triangulation device so that optimum deposition condition is achieved).

6. The method of claim 5, wherein the deposition is controlled by modulating the laser (Col. 10, lines 1-25, i.e., the use of a continuously variable beam attenuator reads on modulating the laser).

7. The method of claim 6, wherein the modulation of the laser is in the kilohertz rage (Col. 10, lines 1-25, specifically lines 23-25).

8. The method of claim 6, wherein the modulation of the laser is up to 20 kHz (Col. 10, lines 1-25, specifically lines 23-25). Jeantette discloses that any laser with sufficient power and reasonable absorption to melt the material would suffice as a laser source (Col. 9, lines 15-24).

However, Jeantette does not specifically disclose a diode laser to create a melt pool and without using any source of energy other than the diode laser used to heat **but** Kar discloses the use of a diode laser in an analogous system (Kar, Col. 4, lines 11- 48; Col. 8, lines 44-49, i.e., the invention can use other high power lasers (i.e.. Nd- based solid state lasers), and diode lasers, and the like. The invention works with continuous and pulsed lasers that supply sufficient intensity for material melting), without using any source of energy other than the diode laser used to heat (Fig. 10, FIG. 10 shows an example of Multiple-Application systems using diode laser).

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of Jeantette with the system of Kar because a diode laser is a laser with sufficient power and reasonable absorption to melt a deposited material as required by Jeantette (Kar, Col. 8. 27-64).

3. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis (5,837,960) in view of Jeantette et al. (US 6,046,426) and further in view of Kar et al. (US 6,526,327 B2).

As for claims 5-6, and 9 Lewis teaches:

5. A method of depositing material on a substrate (Col. 1, lines 10-14), comprising the steps of: heating the substrate with a high-power, rapid-response laser to create a melt pool in a laser interaction zone (Col. 3, lines 25-36; Col. 4, lines 22-50); feeding material into the melt pool to create a deposit having a physical dimension (Col.

3, lines 25-36; Col. 7, lines 4-40; Col. 6, lines 53-59). 6. The method of claim 5, wherein the deposition is controlled by modulating the laser (Col. 14, lines 24-30; Col. 19, lines 48-52).

However, Lewis does not disclose some limitations of claims 5, 7-8 but Jeantette discloses such limitations as follows:

As for claim 5 and 9,

monitoring the laser interaction zone to generate an optical signal indicative of the physical dimension (Col. 8, lines 28-60, i.e., a laser based triangulation device uses a diode laser that allows real-time, position-sensing data to be used to correct for variation in layer thickness, and provide a further signal for closed-loop process control; and controlling the deposition using the optical signal (Col. 8, lines 28-67, i.e. feedback control or closed-loop control is used with the laser triangulation device so that optimum deposition condition is achieved).

As for claims 7-8,

7. The method of claim 6, wherein the modulation of the laser is in the kilohertz range (Col. 10, lines 1-25, specifically lines 23-25).

8. The method of claim 6, wherein the modulation of the laser is up to 20 kHz (Col. 10, lines 1-25, specifically lines 23-25).

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of Lewis with the system for producing complex-shape objects of Jeantette because it would provide an improved system for preventing variations in layer thickness (Jeantette, Col. 8, lines 28- 60).

Lewis and Jeantette disclose most of the limitations of claims 5 and 9 above and further disclose that any diode laser with sufficient power or energy to melt the material may be used (see Lewis, Col. 19, lines 48-51 and Jeantette, Col. 9, lines 22-24). However, Lewis and Jeantette fail to specifically disclose using a diode laser to melt the pool. But Kar discloses the use of a diode laser in an analogous system (Kar, Col. 4, lines 11-48; Col. 8, lines 44-49, i.e., the invention can use other high power lasers (i.e., Nd-based solid state lasers), and diode lasers, the like. The invention works with continuous and pulsed lasers that supply sufficient intensity for material melting).

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of Jeantette and Lewis with the system of Kar because a diode laser is a laser with sufficient power and reasonable absorption to melt a deposited material as required by Lewis and Jeantette (Kar, Col. 8. 27-64).

#### ***Response to Amendment/Response to Arguments***

4. Applicant argues that newly added limitation “directly, without using any source of energy other than the diode laser used to heat” does not disclose in the cited prior art

(Lewis , Jeantette and Kar). Examiner disagrees since Fig. 10 of Kar shows the heating sources is only diode laser.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed Kidest Bahta whose telephone number is 571-272-3737.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number



for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval IPAIRI system. Status information for published applications may be obtained from either Private PMR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAG system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Kidest Bahta/

Primary Examiner, Art Unit 2123